

larger ones, and having laid down his position, he proceeds to show, by his own interesting treatment of the theme, how large and important a subject that of limnology is, and how much neglected it has been in spite of the vast amount of information scattered in detail through the scientific literature of Europe.

Diatoms, Cyanophyceæ, Green Algæ, Fungi, and larger Schizomycetes, Protozoa, Rotifera, Crustacea, Polyzoa, Sponges, and miscellaneous higher aquatic plants and animals are dealt with in detail, and very interesting particulars are given of their numbers, distribution, and seasonal abundance in lakes and rivers, as well as many of their biological peculiarities.

Probably few people are aware that some of these small organisms contain powerfully odorous oils, and are responsible for the strong and unpleasant smell of certain waters, quite apart from decomposition.

We think, in spite of the many interesting facts regarding the existence of thermophilous organisms, the biology of blue-green algæ, &c., the author has missed some opportunities. For instance, we find no discussion or even mention of that puzzling phenomenon, the "Breaking of the Meres," although some of the organisms now known to be concerned—*Anabaena*, *Aphanozomenon*, &c.—are referred to. Again, it seems surprising that no reference occurs to the important rôle of such organisms as *Phormidium* in building up "Tufa," "Travertin," and other calcareous and siliceous substrata, particularly as some of the most striking examples occur in the United States.

Prof. Mason's little book proposes, if not protests, too much, as it is manifestly impossible for any author to cover the ground implied in the title in 126 small octavo pages of large print; and although we may give him credit for clear writing, an excellent selection of materials, and a general "up-to-date" style of presentment—including modern tables and charts—we cannot recommend this gossip about the chemical examination of water, with a smattering of bacteriological methods, as a serious textbook for students. On the other hand, we do commend it to the would-be writers of similar books in this country as indicating some of the new directions in which such writings should depart, and so abandon the too well-worn grooves in which our present bacteriologists are creeping onward.

Is not "Wolffhüggle," on p. 107, a misprint for Wolffhügel? It recurs on p. 108.

#### HEART AND SCIENCE.

*Kritik der Wissenschaftlichen Erkenntniss.* By Dr. H. v. Schoeler. Pp. viii + 677. (Leipzig: W. Engelmann, 1898.)

A FRIEND of Dr. v. Schoeler's died a victim to his devotion to science, when too late he had reached the conviction that his jealous mistress was not worth the sacrifice he had made for her. What, then, asked v. Schoeler, are the data, what the results of science and philosophy? How shall we free ourselves from their obsession, and make them servants rather than tyrants? Is ethical nihilism the upshot and a pessimism subversive of human endeavour in all directions other than the intellectual? Has Nietzsche, after all, the right of it?

Dr. v. Schoeler answers these questions in the present volume at, perhaps, inordinate length, overloading his work with quotations and instances not always quite relevant to his point. He essays nothing short of a critique of philosophy and of the natural sciences and a constructive theory of life without assumptions. In this task his performance is necessarily very unequal in different sections. His chapter on the ancient philosophy, for instance, is a not very valuable contribution to the history of anticipations. Parmenides is a "Schelling of antiquity," but this does not prevent Heraclitus being called in as a forerunner of the *Identitäts-philosophie*, and the account of Aristotelian science goes little, if at all, beyond what can be learned from G. H. Lewes. On the other hand, where he is more at home and possesses a more living interest, our author's criticisms, if rambling, are often to the point. It is, however, not always quite easy to determine what is intended as mere exegesis, what is the expression of v. Schoeler's own view.

His philosophical sympathies lie on the whole with Kant, interpreted not as containing Idealism of the Hegelian type in germ, but as frankly realistic, relativist, even agnostic. His master is the Kant of the antinomies, and of the unknowable *Ding-an-sich*, treating "freedom" as an ideal amid phenomenal determination. He also has a word of praise for the doctrine of monads, leans a little to Schopenhauer, and accepts the results of evolutionist biology and psychology, though critical of the extent to which they solve ultimate problems, and prepared with Kant to admit the teleological judgment with the limited and relative range allowed it in the third critique. In the scientific field, his interests seem to be mainly what may be termed biological in the wider sense.

The smallness of the results of science in general, however frankly we may admit those results, and the little advance made by either philosophy or science towards the solution of ultimate problems, leads to a provisional relativism almost sceptical. But pure scepticism is negated by the facts of life, and if we reject mechanical constructions as dogmatic, and shrink on our spiritual side from the issue of all dogmatisms and positivisms, and, indeed, of all -isms, in the insanity of Nietzsche, we need to find an escape.

Such an escape, v. Schoeler holds, is not provided by religion. It must be sought for in the idea of humanity, and the furtherance of its ideals in art, in the ethics of family life, and in work in the cause of society. That this earth may or will be dissolved with its phantasmagoria of human knowledge, human passions, human needs, human ideals, lies perhaps not obscurely among the teachings of science. But this pessimism is not subversive of effort and aspiration, so long as it does not despair of the commonwealth. There is no absolute, neither god, nor world, that we can know in other than a relative sense or with other than a relative value, for they have no existence other than a relative one. The advance of the new outlook for the beginning of the twentieth century consists in freeing men from an illusion or a madness, in a new and undogmatic positivism or relativism without pride of intellect, and with a sound hold upon purely relative ideals through the æsthetic and the ethical emotions.

Intellectualism is the curse under which the author's friend fell, a martyr going at the last unwilling to his fate. To this we owe the degeneration held to be typically *fin de siècle*. We must meet the danger, exorcise the curse, by derogating from our claim to construe an absolute, and entering instead upon our heritage as men. "The Ideality of the life of feeling is the remedy."

Dr. v. Schoeler is undoubtedly fitted to write the history of philosophical and scientific ideas in certain fields. His chapter on matter, and his section on the achievement of nineteenth century surgery prove this. And his general power of appreciation and range of interest carry him a long way towards the adequate treatment of his encyclopædic task. But his rhetorical tendencies, shown, for example, in his interesting chapter on Nietzsche, and his exuberance, give the book an ineffectiveness which a smaller work might escape. And there is no index to a critique of all philosophy and all science, though laden on every page with citations!

H. W. B.

#### OUR BOOK SHELF.

*Les Plantes Utiles du Sénégal—Plantes Indigènes—Plantes Exotiques.* Par Le R. P. A. Sébire. Pp. lxx + 341 (Paris: J. B. Baillière et Fils, 1899.)

RAPID strides have been made of late in opening up to commerce the several European possessions on the West Coast of Africa, and though much has already been done so far as vegetable products are concerned, only a small percentage of such products find their way regularly into European commerce, such, for instance, as palm oil, ground nuts, rubbers, chillies, and a few drugs, including kino, cinchona bark (introduced), strophanthus seeds, kola, &c.

With regard to timbers, there is a wide field for development, as there are many valuable woods in the forests that should find a ready market in Europe. African mahogany, afforded by *Khaya senegalensis* and other trees, is regularly imported into Europe, the trade in this timber having, during the last decade, increased enormously, and though it may lack the figure of Central American mahogany, it commands a ready sale in European ports. Taking into consideration all these facts, any contribution, however small, of the nature of the book under review must be accepted with thanks, so long as the facts and figures are trustworthy. In the preparation of the work the author's aim has been to provide those engaged in agricultural pursuits, or in the development of the vegetable economic resources of Senegal, with a manual of useful instruction. The book affords detailed information on indigenous plants, those that have become acclimatised, and further with those recommended for experimental cultivation.

The first forty pages deal with such subjects as the seasons, water supply, soils, injurious insects, &c., and is followed by a list of exotic economic plants cultivated in the country, with notes on the results obtained, the plants being classified according to their uses. Synoptical tables follow of generic and native names, together with a list of medicinal plants, arranged according to the diseases in the treatment of which they are employed. The main portion of the book, covering 300 pages, consists of a list of plants arranged under their respective natural orders, with scientific and native names and details bearing upon their properties, uses, and distribution. This portion of the work contains much valuable information, and bears evidence of zeal in its preparation. Besides dealing with indigenous and acclimatised plants, notes are given on various exotics

and their uses with the view to their introduction into the Colony, or as an aid in determining the properties of indigenous plants upon the assumption that allied species in a given natural order possess similar properties. This is an excellent idea, and adds to the usefulness of the work. An index of Latin and French names, together with lists of native names, complete the work. In a book of this description, written on the spot, one naturally expects to find errors. The scientific names in many instances are obsolete or incorrectly spelled, and due care has not been exercised in the introduction or omission of capital letters, italics, &c. It would have been much better had the information been concentrated under fewer heads, and a good general index of scientific and native names combined would have added to the utility of the book. This may be remedied in another edition, but as the work now stands it can be recommended with confidence to those engaged in the development of the vegetable resources of Tropical Africa as a very useful addition to the limited number of such books already existing. Many illustrations of interesting subjects are intercalated in the text.

J. M. HILLIER.

*Applied Geology.* By J. V. Elsdon, B.Sc. (Lond.), F.G.S. Part II. Pp. vi + 250, with 186 Figures. (London: "The Quarry" Publishing Co., Ltd., 1899.)

THE first part of this work was noticed in NATURE, vol. lviii. (1898), p. 615. The second part consists of eleven chapters and an appendix. The first chapter (Chapter vi. of the work) deals in 19 pages with unstratified ore deposits. In the following chapter (vii.) the occurrence of the non-metalliferous minerals is described. We have, for example,  $2\frac{1}{2}$  pages on coal,  $1\frac{1}{2}$  on petroleum, and 1 on diamonds. As these pages include the illustrations, it is clear that the amount of information is completely out of proportion to the importance of the subject. No doubt the author would plead the lack of space for more, but surely in that case he should have made a judicious selection of the literature bearing on the subjects in question, and given full references to it. The same remark as to the almost complete absence of references applies to the book as a whole. Not only would such references have rendered useful short sketches of great subjects, which, standing alone, are almost useless, but they would have given the weight of authority for many statements which, unsupported, appear dogmatic. Chapter viii. is devoted chiefly to prospecting, developing, bed-mining, and vein-mining. The next four chapters deal with "Building and Ornamental Stones." They are chiefly illustrated by sixteen drawings of microscopic rock sections, clearly executed but without any indication of the amount of magnification. On p. 76 the igneous rocks are classified into three groups—Plutonic, Intrusive and Volcanic; but it by no means follows, as there stated, that intrusive rocks are microcrystalline, still less that volcanic rocks are necessarily partly or entirely glassy, nor is it logical to classify serpentine as intrusive, while peridotite, of which most serpentines are merely altered examples, is termed plutonic. Rocks used in the arts and manufactures are described in Chapter xiii. Engineering geology, especially the subjects of water-supply, embankments, tunnels and cuttings, occupies Chapters xiv. and xv., and the final chapter is devoted to surface features such as soils. In an appendix are given "simple rough methods for the determination of minerals and rocks," and there is a good index.

The work is very readable, well illustrated, and suited for geological students who wish to learn some of the applications of the science. The practical man will also gain useful hints, though he will feel rather at sea in reading some of the petrographical descriptions, and will wish for more details or references on many practical points.